

## IP445A Isolated Digital Output

IP445A modules provide 32 isolated solid-state relay outputs to safely control discrete devices.

A major IP445A advantage is its flexibility. The module supports wide range bipolar (AC or DC) voltage switching. Each port can be configured for high or low-side switches. The outputs are TTL-compatible when configured as low-side switches using on-board socketed pull-up resistors.

Isolation protects your computer system from noise, transient signals, and field wiring faults. Outputs are grouped into four 8-channel ports. Ports are isolated via solid-state relays from the logic and from each other.

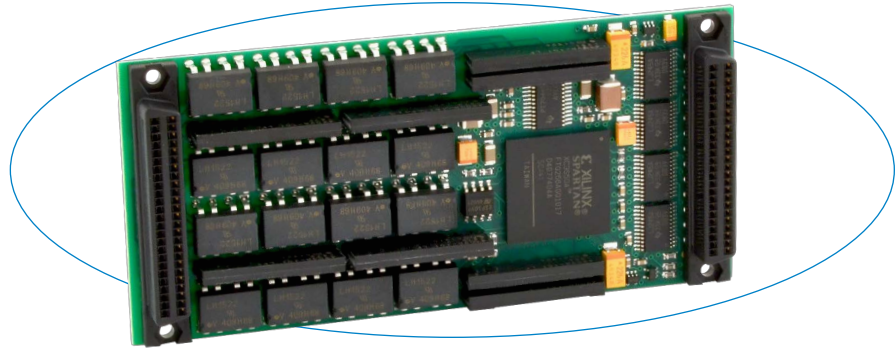
Readback buffers simplify output status monitoring. And for easy closed-loop monitoring of critical control signals, use the IP445A with an IP440A input module.

### Features

- 32 bipolar solid state relays
- High/low-side switch configuration
- Port-isolated output channels
- $\pm 60V$  AC/DC voltage range
- High speed processing (0 wait states)
- TTL-compatible
- Failsafe power-up and system reset
- Output readback function
- Socketed pull-up resistors for low-side switching applications
- Current-limited solid-state relays

### Benefits

- Unique ground reference points for each port permits AC and DC switching on one module.
- Pin are compatible with IP440A input module for loopback monitoring.



When used together, the IP440A input module and IP445A output module simplify loop-back monitoring of your critical signals.

### Specifications

#### Digital Outputs

Output channel configuration: 32 isolated solid-state relays support AC or DC (high/low-side switching) operation.

Isolation: Logic and field connections are optically isolated by solid-state relays. Individual ports are also isolated from each other. Output lines of an individual port share a common connection and are not isolated from each other. IP Logic and field lines are isolated from each other for voltages up to 250V AC or 354V DC on a continuous basis (unit will withstand a 1000V AC dielectric strength test for one minute without breakdown).

Voltage range: 0 to  $\pm 60V$  DC or peak AC.

Output ON current range: 140mA maximum continuous (up to 1A total per port).

Turn on time: IP445A 1mS typical, 2mS maximum.  
IP445AE 1mS typical, 2.5mS maximum\*.

Turn off time: IP445A 1mS typical, 2mS maximum.  
IP445AE 1mS typical, 2.5mS maximum\*.

\*maximum values are measured at 85°C

Output pull-up resistors: 4.7K ohms, socketed.

#### IP Compliance (ANSI/VITA 4)

Meets IP specifications per ANSI/VITA 4-1995.

IP data transfer cycle types supported:  
Input/output (IOSel\*), ID read (IDSel\*).

Access times (8MHz clock): 0 wait states (250ns cycle).

Updates: Requires four 8-bit writes to update all channels.

#### Environmental

Operating temperature: 0 to 70°C (IP445A)  
or -40 to 85°C (IP445AE model).

Storage temperature: -40 to 150°C (all models).

Relative humidity: 5 to 95% non-condensing.

MTBF: 713,455 hrs at 25°C, MIL-HDBK-217F, Notice 2.

Power:

+5V ( $\pm 5\%$ ) all outputs on: 200mA maximum.

$\pm 5V$  ( $\pm 5\%$ ) all outputs off: 8mA maximum.

### Ordering Information

#### Industry Pack Modules IP445A

Digital output module.

#### IP445AE

Same as IP445A plus extended temperature range.

Acromag offers a wide selection of [Industry Pack Carrier Cards](#).

#### Software (see [software documentation](#) for details)

##### IPSW-API-VXW

VxWorks® software support package

##### IPSW-API-QNX

QNX® software support package

##### IPSW-API-WIN

Windows® DLL driver software support package

##### IPSW-LINUX

Linux™ support (website download only)

See [accessories documentation](#) for additional information.

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